

Package: ercv (via r-universe)

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Type Package

Title Fitting Tails by the Empirical Residual Coefficient of Variation

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Description Provides a methodology simple and trustworthy for the analysis of extreme values and multiple threshold tests for a generalized Pareto distribution, together with an automatic threshold selection algorithm. See del Castillo, J, Daoudi, J and Lockhart, R (2014) <[doi:10.1111/sjos.12037](https://doi.org/10.1111/sjos.12037)>.

Depends R (>= 3.5.0)

Suggests poweRlaw, evir

License GPL (>= 2)

NeedsCompilation no

LazyData true

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Contents

ercv-package	2
BIFP	3
bilbao	4
ccdfplot	4
cievi	5

cvevi	6
cvplot	7
EURUSD	9
evicv	9
FFT	10
fitpot	11
iFFT	12
MA	12
ppot	13
qpot	14
tdata	15
thrselect	16
Tm	18
Index	20

ercv-package	<i>Empirical residual coefficient of variation</i>
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Description

Fitting tails by the empirical residual coefficient of variation.

Details

Package:	ercv
Type:	Package
Version:	1.0.1
Date:	2019-09-19
License:	GPL version 2 or newer
LazyLoad:	yes

The package provides a methodology simple and trustworthy for the analysis of extreme values. The package contains functions for visualizing, fitting and validating the distribution of tails. Moreover, it also provides multiple threshold tests for a generalized Pareto distribution, together with an automatic threshold selection algorithm.

Author(s)

Joan del Castillo (Universitat Autònoma de Barcelona), David Morriña Soler (Catalan Institute of Oncology (ICO)-IDIBELL) and Isabel Serra (Centre de Recerca Matemàtica)

References

- del Castillo, J. and Padilla, M. (2016). Modeling extreme values by the residual coefficient of variation. *SORT Statist. Oper. Res. Trans.* **40**(2), 303-320.
- del Castillo, J. and Serra, I. (2015). Likelihood inference for Generalized Pareto Distribution. *Computational Statistics and Data Analysis*, **83**, 116-128.
- del Castillo, J., Daoudi, J. and Lockhart, R. (2014). Methods to Distinguish Between Polynomial and Exponential Tails. *Scandinavian Journal of Statistics*, **41**, 382-393.

See Also

[ercv-package](#), [cievi](#), [ccdfplot](#), [cvevi](#), [cvplot](#), [evicv](#), [fitpot](#), [ppot](#), [qpot](#), [tdata](#), [thrselect](#), [Tm](#)

BIFP

EEMBC AutoBench suite (Benchmark 3)

Description

This data corresponds to 1000 observations sampled from the third benchmark of the well-known suite for real-time systems EEMBC AutoBench suite (Poovey, 2007), including a number of programs used in automotive embedded systems. It corresponds to the basic integer and floating point (BIFP) algorithm.

Usage

BIFP

Format

A numeric vector.

References

- Abella J., Padilla, M., del Castillo, J. & Cazorla, F. (2017). Measurement-Based Worst-Case Execution Time Estimation Using the Coefficient of Variation". *ACM Transactions on Design Automation of Electronic Systems (TODAES)*, **22**(4).
- Poovey, J. (2007). Characterization of the EEMBC Benchmark Suite. North Carolina State University.

bilbao	<i>Bilbao waves data set</i>
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Description

This data corresponds to the Bilbao waves data set, firstly analysed by Castillo and Hadi (1997) and in del Castillo and Serra (2015) from the MLE point of view.

Usage

```
bilbao
```

Format

A numeric vector.

References

Castillo, E. and Hadi, A. S. (1997). Fitting the Generalized Pareto Distribution to Data. *Journal of the American Statistical Association*, **92**, 1609-1620. del Castillo, J. and Serra, I. (2015). Likelihood inference for Generalized Pareto Distribution. *Computational Statistics and Data Analysis*, **83**, 116-128.

ccdfplot	<i>Plot of complementary empirical distribution function and the complementary distribution function</i>
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Description

Plot of complementary empirical distribution function of a sample and the complementary distribution function from peaks-over-threshold model.

Usage

```
ccdfplot(data, pars=NA, log="y", from=NA, ci=FALSE, main="Complementary cdf",
xlab="data", ylab="ccdf", ...)
```

Arguments

data	a numeric vector.
pars	a list with the set of parameters of peaks-over-threshold model.
log	a character string which contains x if the x axis is to be logarithmic, y if the y axis is to be logarithmic and xy or yx if both axes are to be logarithmic.
from	the origen of x-axis in the plot.
ci	should confidence bands be plotted. Defaults to FALSE.

<code>main</code>	an overall title for the plot.
<code>xlab</code>	horizontal axis label. Defaults to <code>data</code> .
<code>ylab</code>	vertical axis label. Defaults to <code>ccdf</code> .
<code>...</code>	usual graphic parameters.

Value

Plot of complementary empirical distribution function and the complementary distribution function.

Author(s)

Joan del Castillo, David Morña Soler and Isabel Serra

References

del Castillo, J. and Padilla, M. (2016). Modeling extreme values by the residual coefficient of variation. *SORT Statist. Oper. Res. Trans.* **40**(2), 303-320.

del Castillo, J. and Serra, I. (2015). Likelihood inference for Generalized Pareto Distribution. *Computational Statistics and Data Analysis*, **83**, 116-128.

del Castillo, J., Daoudi, J. and Lockhart, R. (2014). Methods to Distinguish Between Polynomial and Exponential Tails. *Scandinavian Journal of Statistics*, **41**, 382-393.

See Also

[ercv-package](#), [cievi](#), [cvevi](#), [cvplot](#), [evicv](#), [fitpot](#), [ppot](#), [qpot](#), [tdata](#), [thrselect](#), [Tm](#)

Examples

```
data(iFFT)
ccdfplot(iFFT)
```

`cievi`

Confidence interval for extreme value index

Description

Confidence interval for extreme value index estimation by `Tm` method.

Usage

```
cievi(nextremes, evi=0, conf.level=0.90, m=10, nsim=100)
```

Arguments

nextremes	the number of upper extremes to be used.
evi	extreme value index. In particular, the shape parameter of a generalized Pareto distribution.
conf.level	confidence level of the interval.
m	number of thresholds to do multiplicial test.
nsim	number of simulation.

Value

A numerical vector with two elements, containing the limits of the interval.

Author(s)

Joan del Castillo, David Moríña Soler and Isabel Serra

References

- del Castillo, J. and Padilla, M. (2016). Modeling extreme values by the residual coefficient of variation. *SORT Statist. Oper. Res. Trans.* **40**(2), 303-320.
- del Castillo, J. and Serra, I. (2015). Likelihood inference for Generalized Pareto Distribution. *Computational Statistics and Data Analysis*, **83**, 116-128.
- del Castillo, J., Daoudi, J. and Lockhart, R. (2014). Methods to Distinguish Between Polynomial and Exponential Tails. *Scandinavian Journal of Statistics*, **41**, 382-393.

See Also

[ercv-package](#), [cievi](#), [ccdfplot](#), [cvevi](#), [cvplot](#), [evicv](#), [fitpot](#), [ppot](#), [qpot](#), [tdata](#), [thrselect](#), [Tm](#)

Examples

```
cvevi(70, evi=0)
```

cvevi

Coefficient of variation for a given extreme value index

Description

The coefficient of variation for a given extreme value index in the generalized Pareto distribution.

Usage

```
cvevi(evi)
```

Arguments

`evi` extreme value index. In particular, the shape parameter of a generalized Pareto distribution. It has to satisfy $evi < 1/2$.

Value

A numerical value containing the coefficient of variation for the given extreme value index.

Author(s)

Joan del Castillo, David Moriña Soler and Isabel Serra

References

del Castillo, J. and Padilla, M. (2016). Modeling extreme values by the residual coefficient of variation. *SORT Statist. Oper. Res. Trans.* **40**(2), 303-320.

del Castillo, J. and Serra, I. (2015). Likelihood inference for Generalized Pareto Distribution. *Computational Statistics and Data Analysis*, **83**, 116-128.

del Castillo, J., Daoudi, J. and Lockhart, R. (2014). Methods to Distinguish Between Polynomial and Exponential Tails. *Scandinavian Journal of Statistics*, **41**, 382-393.

See Also

[ercv-package](#), [cievi](#), [ccdfplot](#), [cvevi](#), [cvplot](#), [evicv](#), [fitpot](#), [ppot](#), [qpot](#), [tdata](#), [thrselect](#), [Tm](#)

Examples

```
cvevi(-1)
```

cvplot

Exploratory empirical residual coefficient of variation

Description

Exploratory empirical residual coefficient of variation for extreme value analysis.

Usage

```
cvplot(data, threshold = NA, nextremes = NA, omit=4, evi=0, main="CVplot",  
        conf.level=0.90, xlab="Excluded sample size",  
        ylab="Coefficient of variation", col="blue", ...)
```

Arguments

<code>data</code>	a numeric vector.
<code>threshold</code>	a threshold value (either this or <code>nextremes</code> must be given but not both).
<code>nextremes</code>	the number of upper extremes to be used (either this or <code>threshold</code> must be given but not both).
<code>omit</code>	the minimum required number of upper extremes for computing residual statistics.
<code>evi</code>	extreme value index. In particular, the shape parameter of a generalized Pareto distribution.
<code>main</code>	an overall title for the plot.
<code>conf.level</code>	confidence level of the interval (defaults to 0.90).
<code>xlab</code>	horizontal axis label. Defaults to Excluded sample size.
<code>ylab</code>	vertical axis label. Defaults to Coefficient of variation.
<code>col</code>	plot color. Defaults to blue.
<code>...</code>	Usual graphic parameters.

Value

Plot of the empirical residual CV and confidence intervals.

Author(s)

Joan del Castillo, David Morriña Soler and Isabel Serra

References

- del Castillo, J. and Padilla, M. (2016). Modeling extreme values by the residual coefficient of variation. *SORT Statist. Oper. Res. Trans.* **40**(2), 303-320.
- del Castillo, J. and Serra, I. (2015). Likelihood inference for Generalized Pareto Distribution. *Computational Statistics and Data Analysis*, **83**, 116-128.
- del Castillo, J., Daoudi, J. and Lockhart, R. (2014). Methods to Distinguish Between Polynomial and Exponential Tails. *Scandinavian Journal of Statistics*, **41**, 382-393.

See Also

[ercv-package](#), [cievi](#), [ccdfplot](#), [cvevi](#), [evicv](#), [fitpot](#), [ppot](#), [qpot](#), [tdata](#), [thrselect](#), [Tm](#)

Examples

```
data("moby", package = "powerLaw")
cvplot(moby, main="MobyDick")

data(iFFT)
cvplot(iFFT, threshold=median(iFFT), main="iFFT")
```

EURUSD	<i>Euro/Dollar daily exchange rates</i>
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Description

This data corresponds to the euro/dollar daily exchange rates between 1999 and 2016, including the financial crisis of 2007-2008, which has been generated from the package `quantmod` (Ryan, 2016).

Usage

```
EURUSD
```

Format

A data frame with 6575 rows and 1 column.

References

Ryan, J. A. (2016). `quantmod`: Quantitative Financial Modelling Framework. R package version 0.4-7. <https://CRAN.R-project.org/package=quantmod>

evicv	<i>Extreme value index</i>
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Description

The extreme value index for a given coefficient of variation in the generalized Pareto distribution.

Usage

```
evicv(cv)
```

Arguments

`cv` coefficient of variation. It has to satisfy $cv > 0$.

Value

The extreme value index for a given coefficient of variation in the generalized Pareto distribution as a numerical value.

Author(s)

Joan del Castillo, David Moriña Soler and Isabel Serra

References

- del Castillo, J. and Padilla, M. (2016). Modeling extreme values by the residual coefficient of variation. *SORT Statist. Oper. Res. Trans.* **40**(2), 303-320.
- del Castillo, J. and Serra, I. (2015). Likelihood inference for Generalized Pareto Distribution. *Computational Statistics and Data Analysis*, **83**, 116-128.
- del Castillo, J., Daoudi, J. and Lockhart, R. (2014). Methods to Distinguish Between Polynomial and Exponential Tails. *Scandinavian Journal of Statistics*, **41**, 382-393.

See Also

[ercv-package](#), [cievi](#), [ccdfplot](#), [cvevi](#), [cvplot](#), [fitpot](#), [ppot](#), [qpot](#), [tdata](#), [thrselect](#), [Tm](#)

Examples

```
evicv(2)
```

FFT

EEMBC AutoBench suite (Benchmark 2)

Description

This data corresponds to 1000 observations sampled from the second benchmark of the well-known suite for real-time systems EEMBC AutoBench suite (Poovey, 2007), including a number of programs used in automotive embedded systems. It corresponds to the fast fourier transform (FFT) algorithm.

Usage

```
FFT
```

Format

A numeric vector.

References

- Abella J., Padilla, M., del Castillo, J. & Cazorla, F. (2017). Measurement-Based Worst-Case Execution Time Estimation Using the Coefficient of Variation". *ACM Transactions on Design Automation of Electronic Systems (TODAES)*, **22**(4).
- Poovey, J. (2007). Characterization of the EEMBC Benchmark Suite. North Carolina State University.

`fitpot`*Fits peaks-over-threshold model of a sample*

Description

Fits peaks-over-threshold model of a sample.

Usage

```
fitpot(data, threshold=NA, nextremes=NA, evi=NA)
```

Arguments

<code>data</code>	a numeric vector.
<code>threshold</code>	a threshold value (either this or <code>nextremes</code> must be given but not both).
<code>nextremes</code>	the number of upper extremes to be used (either this or <code>threshold</code> must be given but not both).
<code>evi</code>	extreme value index. In particular, the shape parameter of a generalized Pareto distribution.

Value

A data frame with the following columns:

- `evi` extreme value index. In particular, the shape parameter of a generalized Pareto distribution.
- `psi` the scale parameter of a generalized Pareto distribution.
- `threshold` a threshold value where peaks-over-threshold is applied.
- `prob` proportion of size of data corresponding to the upper extremes modelled with generalized pareto distribution.

Author(s)

Joan del Castillo, David Morña Soler and Isabel Serra

References

- del Castillo, J. and Padilla, M. (2016). Modeling extreme values by the residual coefficient of variation. *SORT Statist. Oper. Res. Trans.* **40**(2), 303-320.
- del Castillo, J. and Serra, I. (2015). Likelihood inference for Generalized Pareto Distribution. *Computational Statistics and Data Analysis*, **83**, 116-128.
- del Castillo, J., Daoudi, J. and Lockhart, R. (2014). Methods to Distinguish Between Polynomial and Exponential Tails. *Scandinavian Journal of Statistics*, **41**, 382-393.

See Also

[ercv-package](#), [cievi](#), [ccdfplot](#), [cvevi](#), [cvplot](#), [evicv](#), [ppot](#), [qpot](#), [tdata](#), [thrselect](#), [Tm](#)

Examples

```
data("nidd.thresh", package = "evir")
fitpot(nidd.thresh)
```

iFFT

EEMBC AutoBench suite (Benchmark 1)

Description

This data corresponds to 1000 observations sampled from the first benchmark of the well-known suite for real-time systems EEMBC AutoBench suite (Poovey, 2007), including a number of programs used in automotive embedded systems. It corresponds to the inverse fast fourier transform (iFFT) algorithm.

Usage

```
iFFT
```

Format

A numeric vector.

References

Abella J., Padilla, M., del Castillo, J. & Cazorla, F. (2017). Measurement-Based Worst-Case Execution Time Estimation Using the Coefficient of Variation". *ACM Transactions on Design Automation of Electronic Systems (TODAES)*, **22**(4).

Poovey, J. (2007). Characterization of the EEMBC Benchmark Suite. North Carolina State University.

MA

EEMBC AutoBench suite (Benchmark 4)

Description

This data corresponds to 1000 observations sampled from the fourth benchmark of the well-known suite for real-time systems EEMBC AutoBench suite (Poovey, 2007), including a number of programs used in automotive embedded systems. It corresponds to the matrix arithmetic (MA) algorithm.

Usage

MA

Format

A numeric vector.

References

Abella J., Padilla, M.,del Castillo, J. & Cazorla, F. (2017). Measurement-Based Worst-Case Execution Time Estimation Using the Coefficient of Variation". *ACM Transactions on Design Automation of Electronic Systems (TODAES)*, **22**(4).

Poovey, J. (2007). Characterization of the EEMBC Benchmark Suite. North Carolina State University.

ppot	<i>Cumulative distribution function</i>
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Description

Cumulative distribution function from the peaks-over-threshold model.

Usage

```
ppot(q, pars, lower.tail=TRUE, log.p=FALSE)
```

Arguments

q	vector of quantiles.
pars	a numeric vector with the set of parameters of peaks-over-threshold model. The names of the elements have to be <code>evi</code> , <code>psi</code> , <code>threshold</code> , <code>prob</code> .
<code>lower.tail</code>	logical; if TRUE (default), probabilities are $P[X \leq x]$ otherwise, $P[X > x]$.
<code>log.p</code>	logical; if TRUE probabilities are given as $\log(p)$.

Value

Cumulated probability function as a numerical value.

Author(s)

Joan del Castillo, David Moriña Soler and Isabel Serra

References

- del Castillo, J. and Padilla, M. (2016). Modeling extreme values by the residual coefficient of variation. *SORT Statist. Oper. Res. Trans.* **40**(2), 303-320.
- del Castillo, J. and Serra, I. (2015). Likelihood inference for Generalized Pareto Distribution. *Computational Statistics and Data Analysis*, **83**, 116-128.
- del Castillo, J., Daoudi, J. and Lockhart, R. (2014). Methods to Distinguish Between Polynomial and Exponential Tails. *Scandinavian Journal of Statistics*, **41**, 382-393.

See Also

[ercv-package](#), [cievi](#), [ccdfplot](#), [cvevi](#), [cvplot](#), [evicv](#), [fitpot](#), [qpot](#), [tdata](#), [thrselect](#), [Tm](#)

Examples

```
ppot(1.9, c(evi=0.1, psi=0.2, threshold=0.3, prob=0.4), lower.tail=FALSE)

x<-runif(10000)
x<-c(x^-1,x)
pars<-fitpot(x,1)
ppot(10,pars$coeff,lower.tail=FALSE) #the true value is 0.5/10
```

qpot

Quantile function

Description

Quantile function from the peaks-over-threshold model.

Usage

```
qpot(p, pars, lower.tail=TRUE, log.p=FALSE)
```

Arguments

<code>p</code>	vector of probabilities.
<code>pars</code>	a numeric vector with the set of parameters of peaks-over-threshold model. The names of the elements have to be <code>evi</code> , <code>psi</code> , <code>threshold</code> , <code>prob</code> .
<code>lower.tail</code>	logical; if TRUE (default), probabilities are $P[X \leq x]$ otherwise, $P[X > x]$.
<code>log.p</code>	logical; if TRUE probabilities are given as $\log(p)$.

Value

Quantile function as a numerical value.

Author(s)

Joan del Castillo, David Moriña Soler and Isabel Serra

References

- del Castillo, J. and Padilla, M. (2016). Modeling extreme values by the residual coefficient of variation. *SORT Statist. Oper. Res. Trans.* **40**(2), 303-320.
- del Castillo, J. and Serra, I. (2015). Likelihood inference for Generalized Pareto Distribution. *Computational Statistics and Data Analysis*, **83**, 116-128.
- del Castillo, J., Daoudi, J. and Lockhart, R. (2014). Methods to Distinguish Between Polynomial and Exponential Tails. *Scandinavian Journal of Statistics*, **41**, 382-393.

See Also

[ercv-package](#), [cievi](#), [ccdfplot](#), [cvevi](#), [cvplot](#), [evicv](#), [fitpot](#), [ppot](#), [tdata](#), [thrselect](#), [Tm](#)

Examples

```
qpot(0.1, c(evi=0.1, psi=0.2, threshold=0.3, prob=0.4), lower.tail=FALSE)

x<-runif(10000)
x<-c(x^-1,x)
pars<-fitpot(x,1)
qpot(0.5/10,pars$coeff,lower.tail=FALSE) #the true value is 10
```

tdata

Transforms a heavy-tailed sampled to non-heavy tailed

Description

Transformation of a sample with assumption of heavy-tail to a sample with non-heavy tail.

Usage

```
tdata(data, threshold = NA, nextremes = NA, sigma=NA)
```

Arguments

data	a numeric vector.
threshold	a threshold value (either this or nextremes must be given but not both).
nextremes	the number of upper extremes to be used (either this or threshold must be given but not both).
sigma	the scale parameter divided by shape parameter in generalized Pareto distribution.

Value

The transformed data as a numerical vector.

Author(s)

Joan del Castillo, David Morriña Soler and Isabel Serra

References

- del Castillo, J. and Padilla, M. (2016). Modeling extreme values by the residual coefficient of variation. *SORT Statist. Oper. Res. Trans.* **40**(2), 303-320.
- del Castillo, J. and Serra, I. (2015). Likelihood inference for Generalized Pareto Distribution. *Computational Statistics and Data Analysis*, **83**, 116-128.
- del Castillo, J., Daoudi, J. and Lockhart, R. (2014). Methods to Distinguish Between Polynomial and Exponential Tails. *Scandinavian Journal of Statistics*, **41**, 382-393.

See Also

[ercv-package](#), [cievi](#), [ccdfplot](#), [cvevi](#), [cvplot](#), [evicv](#), [fitpot](#), [ppot](#), [qpot](#), [thrselect](#), [Tm](#)

Examples

```
data("danish", package = "evir")
tdata(danish)
```

thrselect

Threshold selection algorithm

Description

Threshold selection algorithm.

Usage

```
thrselect(data, threshold=NA, nextremes=NA, omit=16, evi=NA, m=10, nsim=100,
          conf.level=0.90, oprint=TRUE)
```

Arguments

<code>data</code>	a numeric vector.
<code>threshold</code>	a threshold value (either this or <code>nextremes</code> must be given but not both).
<code>nextremes</code>	the number of upper extremes to be used (either this or <code>threshold</code> must be given but not both).
<code>omit</code>	the minimum required number of upper extremes for computing residual statistics.
<code>evi</code>	extreme value index. In particular, the shape parameter of a generalized Pareto distribution.
<code>m</code>	number of thresholds to do multiplical test.
<code>nsim</code>	number of simulations.

<code>conf.level</code>	confidence level of the interval.
<code>oprint</code>	logical. If TRUE (default), the single solution is printed. In any case, the full solution is the output of the function.

Value

A list including two `data.frame` (solution and options). Each of the `data.frame` contains the following columns:

- `m` number of thresholds for testing tail index.
- `nextremes` number of thresholds for testing tail index.
- `threshold` the threshold value
- `rcv` residual coefficient of variation for selected threshold.
- `cvopt` optimal coefficient of variation for the tail.
- `evi` the corresponding tail index for optimal coefficient of variation if `evi` parameter is NA.
- `tms` the statistic of the tail index test.
- `pvalue` p-value associated to `tms`.

Author(s)

Joan del Castillo, David Morriña Soler and Isabel Serra

References

- del Castillo, J. and Padilla, M. (2016). Modeling extreme values by the residual coefficient of variation. *SORT Statist. Oper. Res. Trans.* **40**(2), 303-320.
- del Castillo, J. and Serra, I. (2015). Likelihood inference for Generalized Pareto Distribution. *Computational Statistics and Data Analysis*, **83**, 116-128.
- del Castillo, J., Daoudi, J. and Lockhart, R. (2014). Methods to Distinguish Between Polynomial and Exponential Tails. *Scandinavian Journal of Statistics*, **41**, 382-393.

See Also

[ercv-package](#), [cievi](#), [ccdfplot](#), [cvevi](#), [cvplot](#), [evicv](#), [fitpot](#), [ppot](#), [qpot](#), [tdata](#), [Tm](#)

Examples

```
data("nidd.thresh", package = "evir")
thrselect(nidd.thresh, nsim=500)
```

Tm *Multiple threshold test for a GPD*

Description

Multiple threshold test for a GPD.

Usage

```
Tm(data, threshold = NA, nextremes = NA, omit = 16, evi = NA, m = 10, nsim = 100)
```

Arguments

data	a numeric vector.
threshold	a threshold value (either this or nextremes must be given but not both).
nextremes	the number of upper extremes to be used (either this or threshold must be given but not both).
omit	the minimum required number of upper extremes for computing residual statistics.
evi	extreme value index. In particular, the shape parameter of a generalized Pareto distribution.
m	number of thresholds to do multiplical test.
nsim	number of simulations.

Value

A data.frame containing the following columns:

- nextremes the number of upper extremes to be used.
- cvopt optimal coefficient of variation for the tail.
- evi the corresponding tail index for optimal coefficient of variation if evi parameter is NA.
- tms the statistic of the tail index test.
- pvalue p-value associated to tms.

Author(s)

Joan del Castillo, David Morña Soler and Isabel Serra

References

- del Castillo, J. and Padilla, M. (2016). Modeling extreme values by the residual coefficient of variation. *SORT Statist. Oper. Res. Trans.* **40**(2), 303-320.
- del Castillo, J. and Serra, I. (2015). Likelihood inference for Generalized Pareto Distribution. *Computational Statistics and Data Analysis*, **83**, 116-128.
- del Castillo, J., Daoudi, J. and Lockhart, R. (2014). Methods to Distinguish Between Polynomial and Exponential Tails. *Scandinavian Journal of Statistics*, **41**, 382-393.

See Also

[ercv-package](#), [cievi](#), [ccdfplot](#), [cvevi](#), [cvplot](#), [evicv](#), [fitpot](#), [ppot](#), [qpot](#), [tdata](#), [thrselect](#)

Examples

```
data("nidd.thresh", package = "evir")  
Tm(nidd.thresh, evi=0, nextremes = 75)
```

Index

* datasets

BIFP, 3
bilbao, 4
EURUSD, 9
FFT, 10
iFFT, 12
MA, 12

* ercv

ccdfplot, 4
cievi, 5
cvevi, 6
cvplot, 7
ercv-package, 2
evicv, 9
fitpot, 11
ppot, 13
qpot, 14
tdata, 15
thrselect, 16
Tm, 18

BIFP, 3

bilbao, 4

ccdfplot, 3, 4, 6–8, 10, 12, 14–17, 19

cievi, 3, 5, 5, 6–8, 10, 12, 14–17, 19

cvevi, 3, 5, 6, 6, 7, 8, 10, 12, 14–17, 19

cvplot, 3, 5–7, 7, 10, 12, 14–17, 19

ercv (ercv-package), 2

ercv-package, 2

EURUSD, 9

evicv, 3, 5–8, 9, 12, 14–17, 19

FFT, 10

fitpot, 3, 5–8, 10, 11, 14–17, 19

iFFT, 12

MA, 12

ppot, 3, 5–8, 10, 12, 13, 15–17, 19

qpot, 3, 5–8, 10, 12, 14, 14, 16, 17, 19

tdata, 3, 5–8, 10, 12, 14, 15, 15, 17, 19

thrselect, 3, 5–8, 10, 12, 14–16, 16, 19

Tm, 3, 5–8, 10, 12, 14–17, 18